[Workshop handouts on low vision]

By Ruth Holmes

July 10, 11, 1984

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Educational Research

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July 10, 11, 1984

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APPROXIMATE EQUIVALENT VISUAL ACUITY NOTATIONS

These notations are only an indication of the approximate relationship between recordings of distant and near vision. The client's performance may vary considerably from the equivalents shown.

	NEAR				
Distant Snellen	A.M.A.	Jeagar	Metric	Point	Usual Type Found in Printed Materials
20/20 (ft.)	14/14 (in.)	1	0.37 (M.)	3	Mail order catalogs
20/30	14/21	2	0.50	5	Want ads, legal document
20/40	14/28	4	0.75	6	Telephone directory
20/50	14/35	6	0.87	8	Newspaper text
20/60	14/42	8	1.00	9	Adult text books, some magazines
20/80	14/56	10	1.50	12	Children's books 9-12 ye some magazines
20/100	14/70	11	1.75	14	Children's books 8-9 yea
20/120	14/84	12	2.00	18	Large type materials
20/200	14/140	17	3.50	24	Large type materials, newspaper subheadlines
12.5/200	14/224	19	6.00		
8/200	14/336	20	8.00		
5/200	14/560				
3/200	14/900				

TANGENT SCREEN

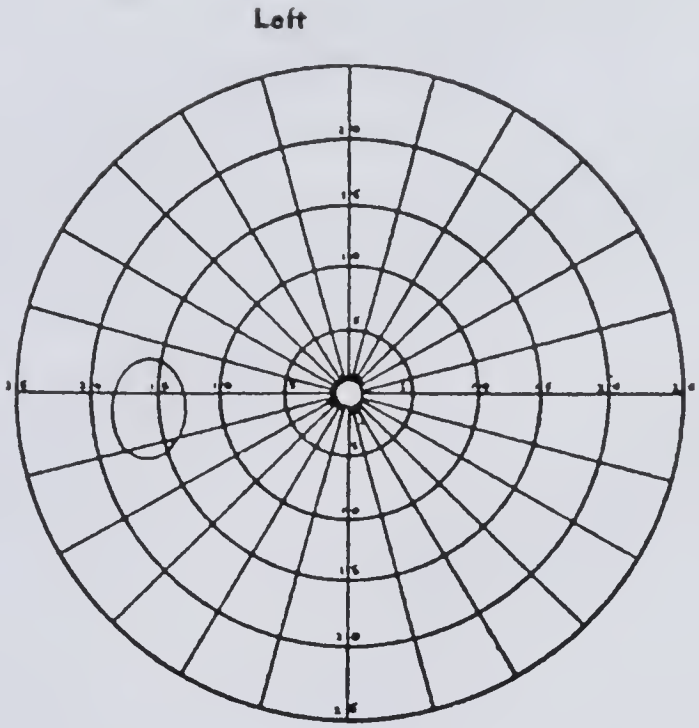
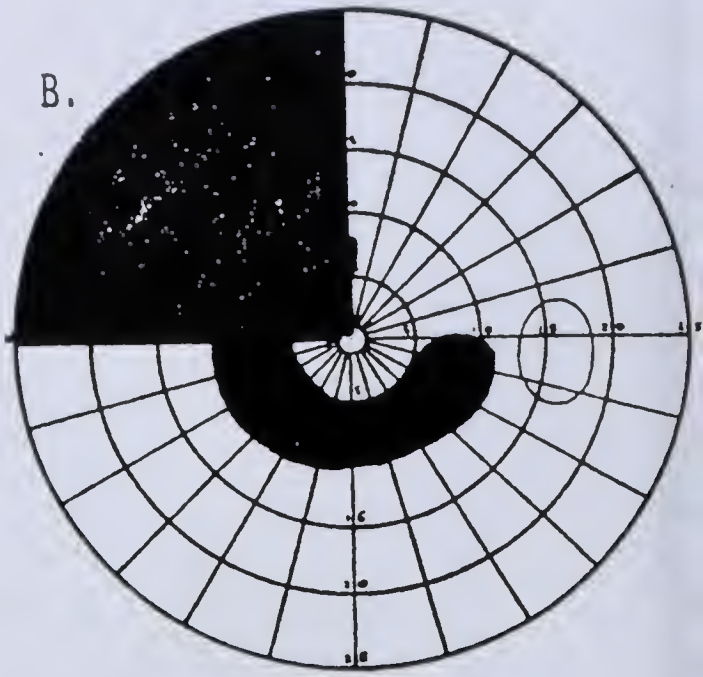


FIGURE 3:
AT THE INTERMEDIATE RANGE OF 1 OR 2 METERS, THE TANGENT SCREEN ACCURATELY DEMONSTRATES DEFECTS IN THE CENTRAL 30 DEGREES.

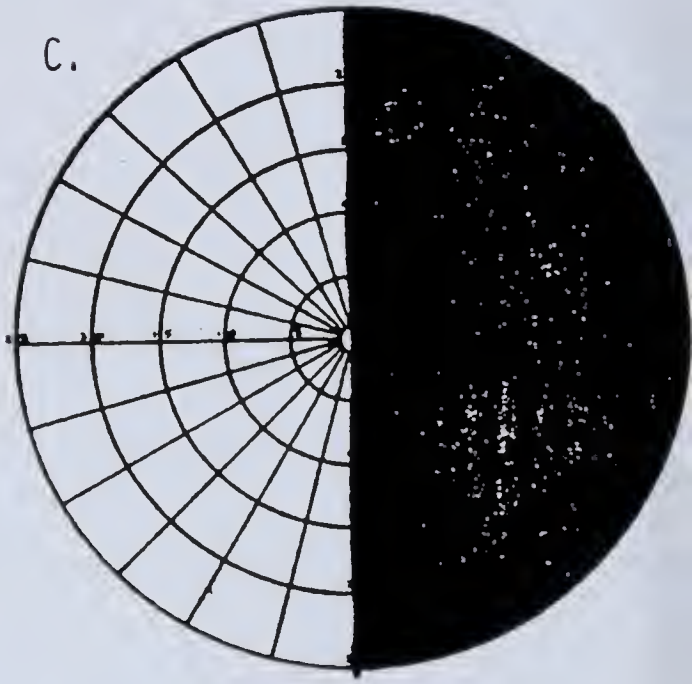
PERIPHERAL FIELD DEFECTS

A.

B.



C.

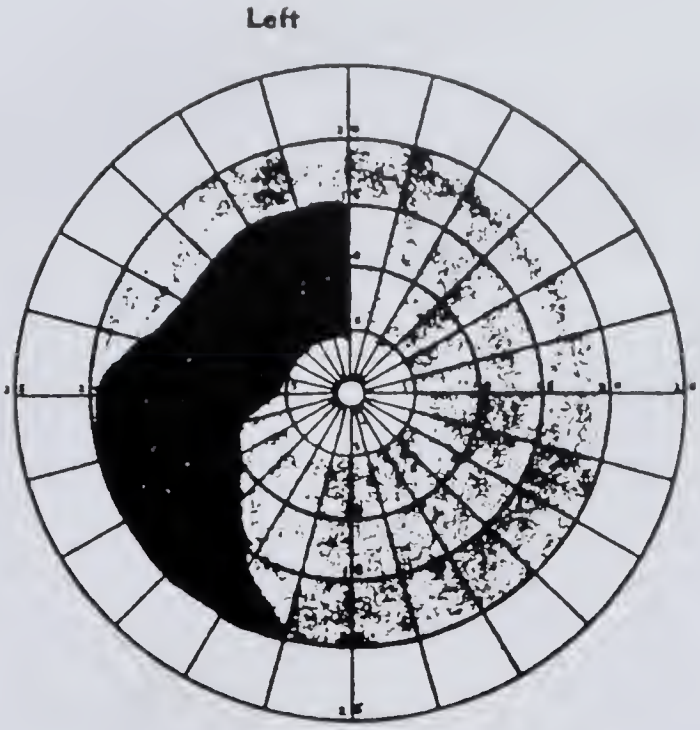


A. ENTIRE PERIPHERAL FIELD IS LOST.

B. SEGMENT AND SECTOR DEFECTS.

C. HEMIANOPIC DEFECTS.

FIGURE 5



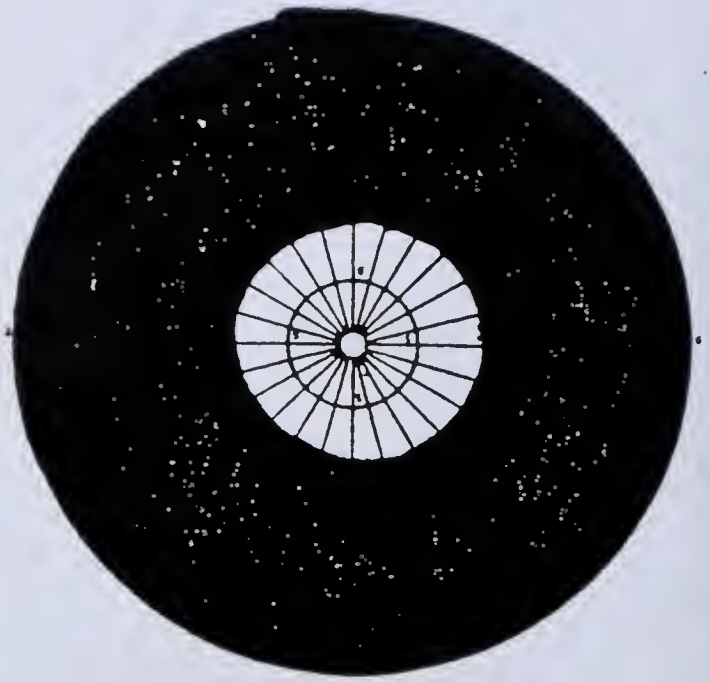
mm. Target Size White
mm. Screen Distance
Colors
Pupil Size
Vision
Tension

Illumination

THE DENSITY AND SIZE OF A FIELD DEFECT VARY WITH THE ILLUMINATION, COLOR, AND SIZE OF OBJECTS. AN ABSOLUTE SCOTOMA (DARK AREA) IS ALWAYS THE SAME SIZE AND IS PERMANENT BECAUSE TISSUE HAS BEEN DESTROYED.

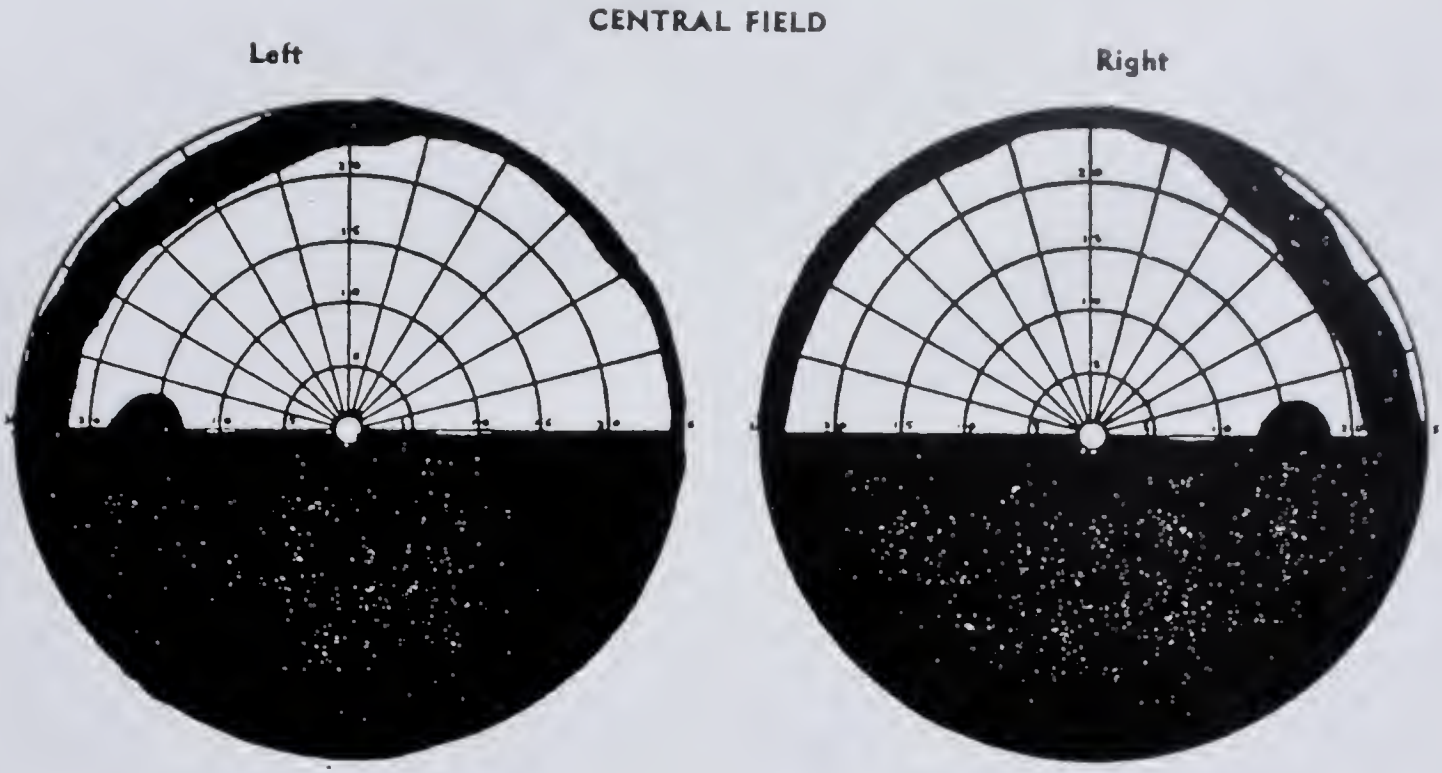
FIGURE 6

10 DEGREE FIELD



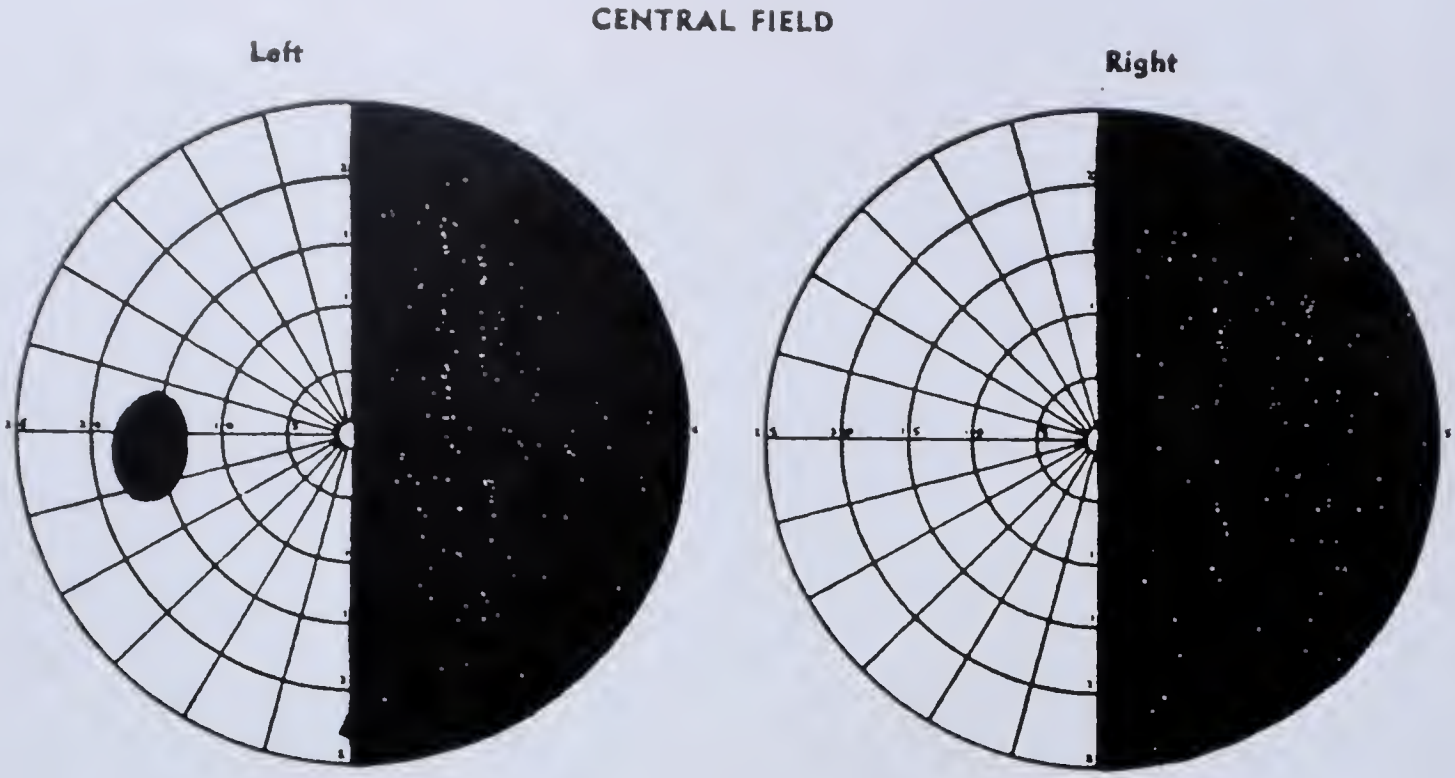
THE DIAMETER OF THE RESIDUAL FIELD AT ANY DISTANCE MAY BE INTERPOLATED FROM THE TANGENT SCREEN TEST RESULTS. FOR EXAMPLE, A 10 DEGREE CENTRAL FIELD AT THE TEST DISTANCE OF 1 METER IS 7 INCHES. AT 20 FEET, THE FIELD IS 42 INCHES. AT A CLOSER WORKING DISTANCE OF 1/4 METER (ABOUT 10 INCHES), THE FIELD IS ONLY 1-3/4 INCHES. THE CLOSE READING FIELD SHOULD PREFERABLY BE MEASURED WITH AN AMSLER GRID.

FIGURE 7



RESTRICTIONS LOCATED IN THE INFERIOR PART OF THE FIELD INTERFERE WITH THE CLIENT'S ABILITY TO SEE DOWNWARD IN HIS IMMEDIATE WALKING FIELD. AT NEAR, THE CLIENT MAY HAVE DIFFICULTY LOCATING DROPPED OBJECTS, SEEING OBJECTS ON A COUNTER OR TABLE, OR FINDING THE NEXT LINE OF PRINT WHEN READING.

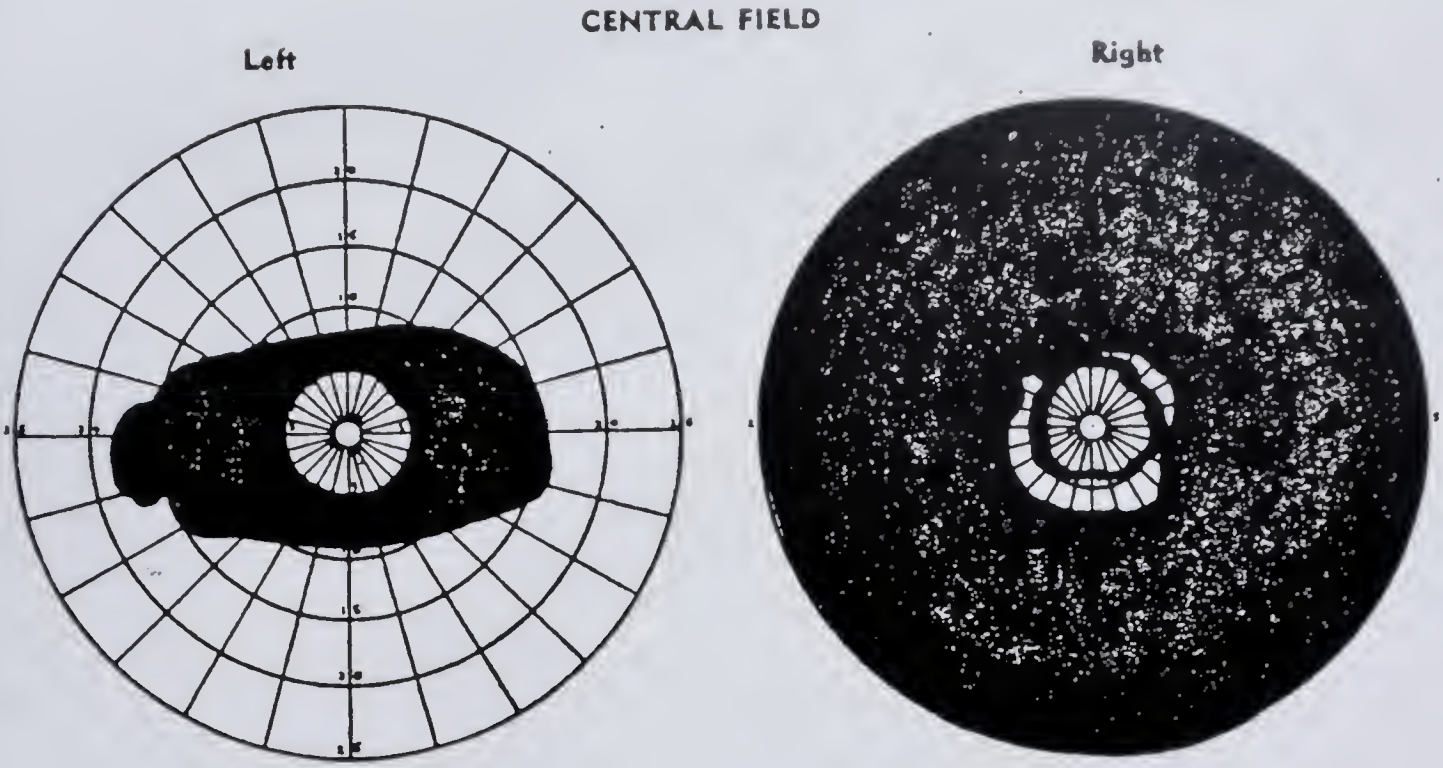
FIGURE 8



HEMIANOPIC DEFECTS TO THE RIGHT INTERFERE WITH READING (THE ANTICIPATION OF THE NEXT WORD) AND PERIPHERAL PERCEPTION OF OBJECTS ON THE RIGHT SIDE.

RIGHT HOMONYMOUS HEMIANOPIA IS THE COMMONEST CAUSE OF FIELD DEFECTS IN ELDERLY PEOPLE AS A RESULT OF A STROKE.

FIGURE 9



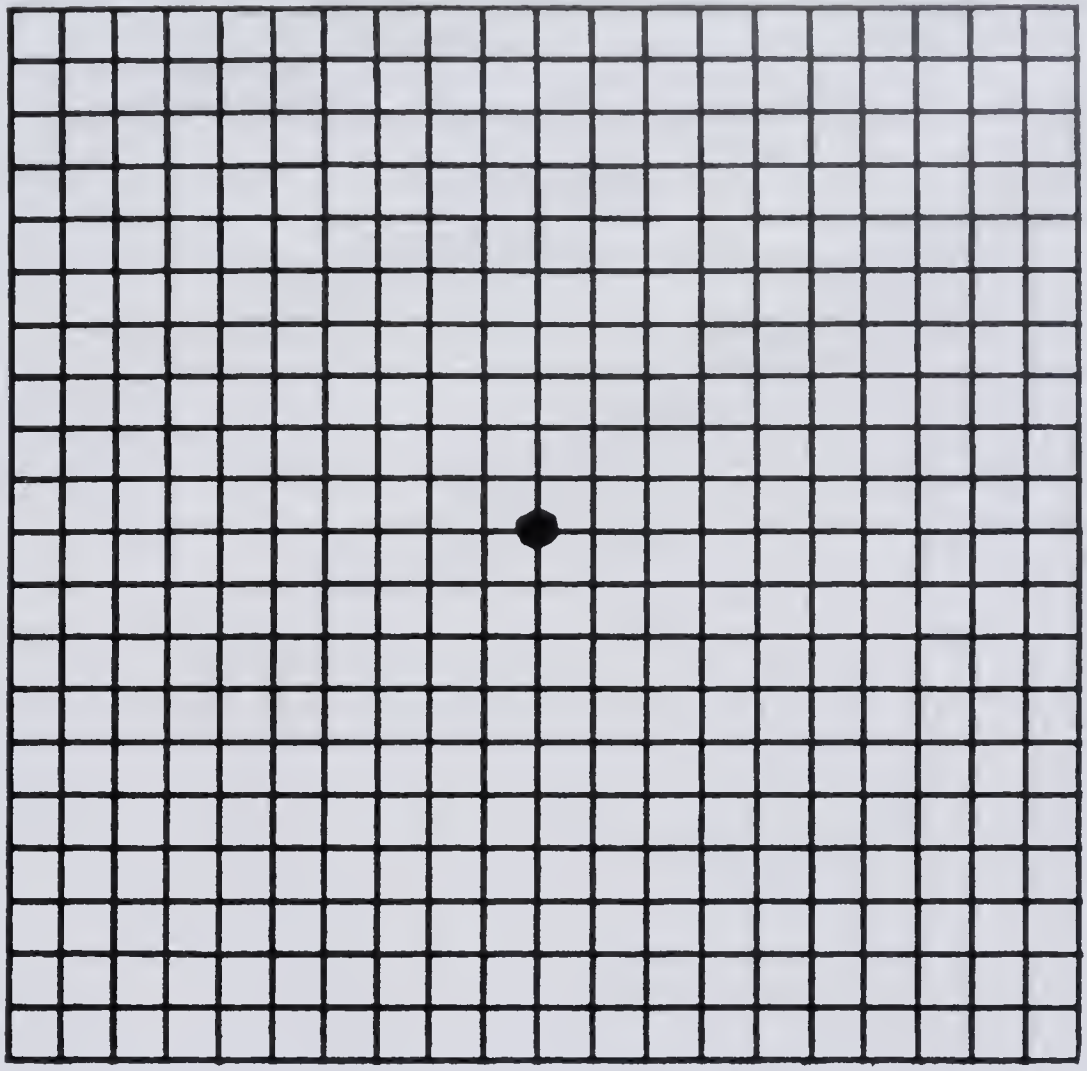
A RING OF PERIMACULAR FIELD LOSS SUCH AS SHOWN ABOVE IN THE LEFT EYE, MAY INTERFERE WITH THE USE OF MAGNIFICATION, WHICH IS NEEDED IF THE CENTRAL VISION IS REDUCED.

GLAUCOMA MAY RESULT IN A PERIMACULAR AS WELL AS A PERIPHERAL FIELD DEFECT AS SHOWN ABOVE IN THE RIGHT EYE. BOTH READING AND TRAVELING ARE DIFFICULT FOR THE CLIENT.

FIGURE 10

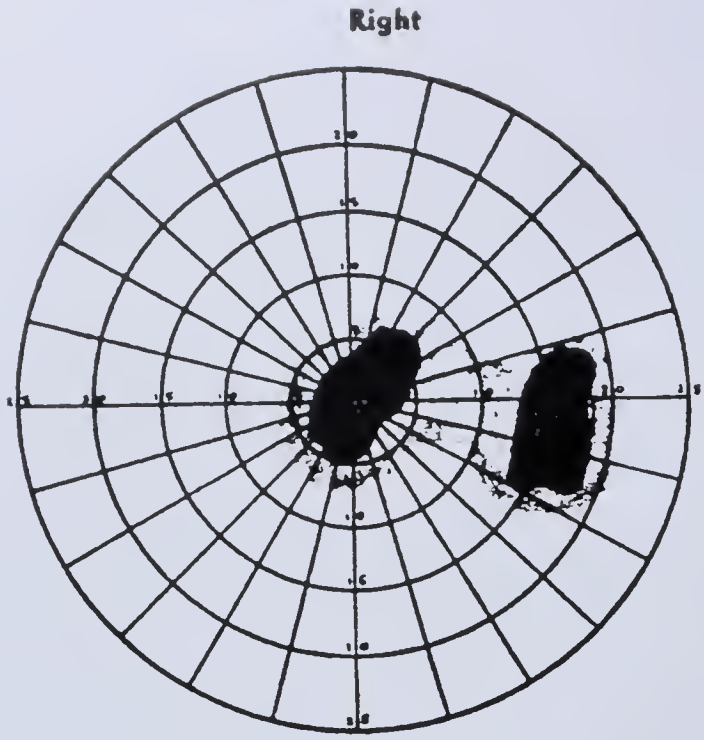
CLIENTS WITH VASCULAR OCCLUSIVE DISEASES, SUCH AS DIABETES OR SICKLE CELL ANEMIA, MAY HAVE BOTH MARKED PERIPHERAL FIELD LOSS AND SECTOR DEFECTS.

FIGURE 11



THE AMSLER GRID TESTS THE FUNCTION OF THE MACULA. THE CLIENT IS ASKED TO LOOK AT THE GRID AND DESCRIBE WHAT HE SEES. IN THIS WAY, THE SIZE AND LOCATION OF THE SCOTOMA MAY BE CHARTED.

FIGURE 12



A CECOCENTRAL SCOTOMA IN THE RIGHT EYE IS PROJECTED TEMPORALLY. THIS MAY CAUSE THE CLIENT DIFFICULTIES WITH READING SPEED AND ACCURACY.

THE DENSITY OF THE SCOTOMA MAY BE AFFECTED BY ILLUMINATION AND SIZE OF THE VIEWED OBJECT.

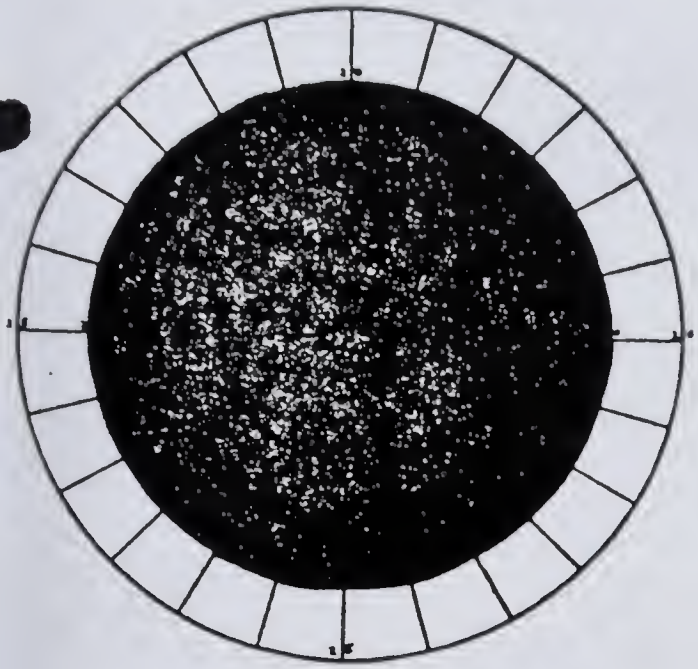


FIGURE 13

IN A HEMORRHAGIC DISEASE SUCH AS DIABETIC RETINOPATHY, THE SCOTOMA IS DENSE AND MAY OCCUPY MORE THAN 20-30 DEGREES OF THE CENTRAL FIELD. VISUAL ACUITY FALLS BELOW 20/200. ONCE THE MACULAR AREA HAS BEEN EXCEEDED, THE PERIPHERAL FIELD HAS PROGRESSIVELY POORER VISUAL ACUITY.

FIGURE 14

IN CASES OF MYOPIC DEGENERATION AND CHORIORETINITIS, SEVERAL ABSOLUTE SCOTOMAS MAY BE SCATTERED THROUGHOUT THE VISUAL FIELD. THIS RANDOM LOCATION OF SCOTOMAS MAY AFFECT THE CLIENT'S ABILITY TO USE THE MAGNIFIED IMAGES PRODUCED BY LOW VISION AIDS.

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See supplement after page 8

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THE CLOSED CIRCUIT TELEVISION SYSTEM

By Gaylen Kapperman
Northern Illinois Univeristy
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Advantages

1. Comfortable sitting position while reading and writing
2. Amount of illumination can be controlled to fit the individual's need
3. Extremely high magnification is possible
4. Field of view is large in comparison to the high magnification
5. Handwriting is smaller and more legible
6. Reverse polarity - images can be dark on a light background or light on a dark background
7. Magnification is variable

Disadvantages

1. Very costly
2. Not portable
3. Depth of focus is not great

Names and Addresses of Manufacturers

Visualtek, Inc.
1610 - 26th Street
Santa Monica, CA 90404

Apollo Electronic Visual Aids
6357 Arizona Circle
Los Angeles, CA 90045

Pelco
351 East Alondra
Gardena, CA 90248

BEHAVIORAL OBJECTIVES FOR TRAINING WITH THE CCTV

By Toni Heinze

1. Student identifies shapes, letters, words on the monitor; matching can also be done; teacher manipulates controls and X-Y table

2. Student tracks line of shapes, letters, words; teacher manipulates controls and X-Y table

3. Student reads simple, high interest passages and answers simple questions; teacher manipulates controls and X-Y table

4. Student arranges physical environment (table, chair, monitor) for his personal comfort and efficiency

5. Student operates monitor and camera (on-off, reverse, magnification, focus)

6. Student arranges visual environment (brightness, contrast, light aperture for basic materials)

7. Student makes size adjustments (material, distance, magnification) using basic materials

8. Student controls X-Y table; starting with #1, 2, 3; using materials with excellent visual properties and basic horizontal/vertical formats at first; basic tracking and reading activities, getting information from simple diagrams and charts; tracking can include symbols, numbers, letters, italics, words within words, answers to questions in short passages, within line, line to line, basic formats (outlines, workbook pages)

9. Student makes part-whole adjustments (start with size optimal for getting as much "gestalt" as possible, then zooming in on specific areas for more detailed information); use maps, pictures, charts, diagrams

10. Student develops a systematic search pattern (explore format and make organized expectations, using reference points, marking systems, increasing the variety of materials being used)

11. Student uses context clues and closure techniques; teacher uses a directed reading approach (mental focus ahead, locate required information, mental review, notetaking skills can be included later)

12. Student develops skimming skills (for headings, specific formats, names, answers, marking systems, etc.)

13. Student continues all of the above skills with an increasing variety of materials; variables can include:

    - amount of detail
    - changes of size
    - changes of print

- increasing complication of formats with decreasing amounts of orientation clues
- speed
- degree of contrast

14. Student develops responding and writing skills; a sequence here might include marking (multiple-choice), tracking (matching tasks of drawing lines from point to point), words (fill in the blanks), groups of words (short answer); formats (math problems), notetaking

15. Student develops skills in using special adaptations (distance, typing, etc.)